## SCIENTIFIC SERIALS.

THE *Quarterly Journal of Microscopical Science* for November 1887 (volume xxviii. part 2) contains the following papers:—On the development of *Peripatus novæ-zealandiæ*, by Lilian Sheldon, Bathurst Student, Newnham College, Cambridge. (Plates 12 to 16.) The ripe ova are large when compared to those of *P. capensis* or *P. edwardsii*, measuring about 1·5 mm. in their long axis; this size seems due to the enormous amount of food-yolk with which the eggs are charged; the segmentation is on the centrolecithal type; the protoplasm is in the form of a reticulum; there are no traces of cell outlines. The various stages, from a want of material, were not in all cases noted, but the authoress with great ability traces many stages of the development of the embryo, until that in which the food material is completely absorbed, so that the embryo lies just within the vitelline membrane and egg shell. We trust that she will continue her investigations as fresh specimens are obtained, until she is enabled to write the whole life-history of this very interesting form.—On some points in the anatomy of Polychæta, by J. T. Cunningham. (Plates 17 to 19.) This paper gives the results of some investigations into certain Polychæte structures; on the nephridia and gonads, with a criticism of Cosmovici's paper on the "Glandes genitales et Organes segmentaires des Annelides Polychetes"; on the cardiac body, and on the neural canals.—On Temnocephala, an aberrant monogenetic Trematode, by William A. Haswell. (Plates 20 to 22.) Four species were found; one, *Temn. novæ-zealandiæ*, found on *Paranephrops setosus*, from rivers of New Zealand; a second, *Temn. minor*, on *Astacopsis bicarinatus*, from streams of New South Wales; a third, *Temn. quadricornis*, on *Astacopsis franklinii*, from northern rivers of Tasmania; and a fourth, *Temn. fasciata*, on *Astacopsis serratus*, streams of New South Wales. Diagnoses of these species are not given, but it is possible to distinguish them by the comparative details given of their structure; they seem to differ from the type species of the genus, *T. chilensis*, Gay; and Wood-Mason is probably wrong in thinking that this latter species is to be found in New Zealand. When undisturbed, the Temnocephala adhere to the surface of the crayfish by means of a sucker.—Notes on Echinoderm morphology, No. xi.: on the development of the apical plates in *Amphiura squamata*, by Dr. P. Herbert Carpenter, F.R.S.

---

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society**, December 8.—"The Post-embryonic Development of *Julus terrestris*." By F. G. Heathcote, M.A. Communicated by Adam Sedgwick, F.R.S.

With regard to the development of the cœlom and generative organs, I have obtained the following results. The somites divide into two parts, as described for *Strongylosoma* by Metschnikoff, one part remaining in the body and the other part projecting into the legs. The cavities in these two parts together constitute the cœlom. The part within the legs breaks up and the cells give rise to muscles. The part within the body passes dorsalwards along the thin sheet of mesoblast which unites it to its fellow of the other side, so that the two vesicle-like parts meet above the nerve-cord in the middle line. They join so as to form a single tube, the generative tube. The young ova, as well as the follicle cells surrounding them, are formed by cells proliferated from the walls of this generative tube. The body parts of the somites of the antennæ and mandibles break up and disappear, but those of the third pair of appendages give rise to the pair of salivary glands. There are two pairs of somites to each double segment.

In the development of the nerve-system, I find that there are two cerebral grooves formed as in *Peripatus*. They disappear early in the development. The ventral nerve-system, which at first consists of two separate cords united by a thin median part, undergoes a process of concentration which results in the presence of a single stout cord showing slight traces of its former double condition.

The heart is formed from mesoblast cells in the body-cavity. These cells, which were directly derived from the hypoblast in the early stages of development, form a network in the body-cavity. The heart is the result of a joining together of the meshes of this network, and thus is formed by the confluence of a series of spaces in the mesoblast, and has nothing to do with the development of the cœlom.

The body-cavity is a series of spaces between the gut and the body-wall, and is divided up by the mesoblast cells already referred to. It is distinct from the cœlomic cavities of the somites, and is therefore a pseudocœle.

The eye-spots are all formed in the same manner. The hypodermis thickens, and a cavity appears within it bounded by pigment. This cavity becomes a distinct vesicle. The front wall of the vesicle becomes very thin and furnishes the lens, while the cells of the back (*i.e.* most internal) wall and sides become elongated and form the retinal elements of the eye. The nuclei of the front wall become very faint and finally disappear.

The most striking feature of the development is the reduction of the ventral part of the young animal and the increase of the dorsal. In the just hatched animal the ventral region is nearly as large as the dorsal, and the legs are wide apart, having a distinct space between them. As development progresses the dorsal region is increased, while the ventral is contracted till the bases of the legs are close together. The corresponding concentration of the nerve-cord I have already mentioned. In a paper on *Euphoberia*, a Carboniferous Myriapod, Mr. Scudder points out that one of the principal points in which the genus differs from existing Diplopoda is the development of the ventral region. The relations of the dorsal and ventral regions of the body of the *Euphoberia* correspond exactly to the condition of the young *Julus*.

With regard to the double segments of *Julus*, Newport held that each double segment corresponded to two segments originally distinct which had fused together; subsequent writers have held that each double segment is a single segment which has developed a second pair of legs. Now considering the double segments with regard to the development as well as to the adult condition, we see that the mesoblastic segmentation is double, so are the tracheal, the nervous, and circulatory systems. The only part of these double segments which is single is the dorsal plate with its stink glands which arise as invaginations in it; this dorsal plate being so enlarged as to form a complete ring round the body of the adult. Looking at the palæontology, we find that in the Archipolypoda, a family including the Archidesmidæ, Euphoberidæ, and Archijulidæ, the dorsal plate did show distinct traces of a division. Therefore I think that each double segment represents two complete segments, the dorsal plates of which have fused together to make one plate.

**Zoological Society**, December 6.—Prof. W. H. Flower, F.R.S., President, in the chair.—Mr. Howard Saunders exhibited (on behalf of the Rev. H. A. Macpherson) a specimen of the Isabelline Chat (*Saxicola isabellina*) shot in Cumberland, being the first recorded occurrence of this species in Great Britain.—Prof. Bell exhibited and made remarks on specimens of the tegumentary glands from the head of the Rocky Mountain Goat (*Haplocerus montanus*).—A communication was read from Prof. H. H. Giglioli and Count T. Salvadori, containing notes on the fauna of Corea and the adjoining coast of Manchuria. The notes were founded on a large collection, principally of Vertebrates, made by order of H.R.H. Prince Thomas of Savoy, Duke of Genoa, whilst he was in command of the *Vettor Pisani*, on a voyage round the world, 1878–81. The collection was stated to be now deposited in the Royal Zoological Museum at Florence.—A communication was read from M. L. Taczanowski, containing a list of birds collected in Corea by M. J. Kalinowski between September 1885 and March 1887. A Woodpecker in the collection was considered to be new to science, and named *Thriponax kalinowskii*.—Prof. W. H. Flower read a paper on the Pygmy Hippopotamus of Liberia (*Hippopotamus liberiensis*), and its claims to distinct generic rank. The specimen of this animal in the National Collection possessed two incisor teeth on one side of the lower jaw. This and other considerations induced the author to question the advisability of separating it generically from *Hippopotamus*.—Mr. Francis Day, communicated a paper by Mr. J. Douglas-Ogilby, of the Australian Museum, Sydney, on a new genus and species of Australian Mugilidæ, which he proposed to designate *Trachystoma multidens*.—Mr. Day also read a second paper by Mr. Ogilby, giving the description of a new genus of Percidæ based on examples taken in the Gulf of St. Vincent, South Australia, which the author proposed to describe as *Chthamalopteryx melbournensis*.—A communication was read from Dr. M. Menzbier, of Moscow, describing a third species of Caucasian Wild Goat. This he proposed to call *Capra severtzovi*, being the *C. caucasica* of Dinnik, but not of Guldenstaedt.—Mr. Blanford read some critical notes on the nomenclature of Indian Mammals, in which he treated of *Macacus ferox*, Shaw (*M. silenus*, auct., *nec* Linn.), *M. irus*, Cuv. (*M. cynomolgus*, auct., *nec* Linn.), *M. rhesus*, *Presbytes thersites* Blyth, *Semnopithecus chrysogaster*, *Felis bengalensis*, *F. jerdoni*, *Herpestes mungo* (*H. griseus*, auct., *nec* Geoffr.), *Vulpes vulgaris*, *V. alopex*, and the genera *Putorius*, *Mustela*, *Xantharpyia*, *Cynonycteris*, *Hipposiderus*, and *Phyllorhina*.

**Geological Society**, December 7.—Prof. J. W. Judd, F.R.S., President, in the chair.—The following communications were read:—A letter from H.M. Secretary of State for the Colonies, inclosing an account of recent discoveries of gold in the Transvaal.—On the age of the altered limestone of Strath, Skye, by Dr. Archibald Geikie, F.R.S. The remarkable alteration of the limestone of Strath into a white saccharoid marble, first described by Macculloch, has hitherto been regarded as an instance of contact-metamorphism in a rock of Liassic age. The various writers who have described the geology of the district have followed Macculloch in classing the whole of the ordinary and altered limestone with the Secondary series of the Inner Hebrides. The author, however, saw reason in 1861 to suspect that some part of the limestone must be of the age of the Durness Limestone of Sutherland—that is, Lower Silurian; and he expressed this suspicion in a joint paper by the late Sir R. I. Murchison and himself, published in the eighteenth volume of the Quarterly Journal of the Society. He has recently returned to the subject, and now offers lithological, stratigraphical, and palæontological evidence that the altered limestone is not Lias, but Lower Silurian. In lithological characters the limestone, where not immediately affected by the intrusion of the eruptive rocks, closely resembles the well-known limestones of the west of Sutherland and Rosshire. It is not more altered than Palæozoic limestones usually are. It contains abundant black chert concretions and nodules, which project from the weathered surfaces of the rock exactly as they do at Durness. These cherts do not occur in any of the undoubted Lias limestones of the shore-sections. The limestone lies in beds, which, however, are not nearly so distinct as those of the Lias, and have none of the interstratifications of dark sandy shale, so conspicuous in the true Liassic series. The stratigraphy of the altered limestone likewise marks it off from the Lias. There appears to be a lower group of dark limestones full of black cherts, and a higher group of white limestones with little or no chert, which may be compared with the two lower groups of the Durness Limestone. A further point of connection between the rocks of the two localities is the occurrence of white quartzite in association with the limestone at several places in Strath, and of representatives of the well-known "fucoid beds" at Ord, in Sleat. These latter strata form a persistent band between the base of the limestone and the top of the quartzite, which may be traced all the way from the extreme north of Sutherland southward into Skye. Palæontological evidence confirms and completes the proof that the limestone is of Lower Silurian age. The author has obtained from the limestone of Ben Suardal, near Broadford, a number of fossils which are specifically identical with those in the Durness Limestone, and so closely resemble them in lithological aspect that the whole might be believed to have come from the same crag. Among the fossils are species of Cyclonema, Murchisonia, Maclurea, Orthoceras, and Piloceras. The relations of the limestones containing these fossils to the other rocks were traced by the author. He showed that the Lias rests upon the Silurian limestone with a strong unconformability, and contains at its base a coarse breccia or conglomerate, chiefly composed of pieces of Silurian limestone, with fragments of chert and quartzite. The metamorphism for which Strath has been so long noted is confined to the Silurian limestone, and has been produced by the intrusion of large bosses of granophyre (Macculloch's "syenite") belonging to the younger, or Tertiary series of igneous rocks. After the reading of the paper some remarks were made by Mr. Etheridge, Dr. Hicks, Mr. Marr, Dr. Hinde, and Mr. Bauerman. In thanking the Fellows for the reception they had given to his paper, Dr. Geikie said that a preliminary sketch of the results of the recent work of the Geological Survey in the north-west of Scotland would, he hoped, be presented to the Society early next year.—On the discovery of Trilobites in the Upper Green (Cambrian) Slates of the Penrhyn Quarry, Bethesda, near Bangor, North Wales, by Dr. Henry Woodward, F.R.S.—On *Thecospondylus daviesi*, Seeley, with some remarks on the classification of the Dinosauria, by Prof. H. G. Seeley, F.R.S.

**Entomological Society**, December 7.—Dr. David Sharp, President, in the chair.—Mr. Jenner-Weir exhibited, and made remarks on, twelve specimens of *Cicadetta hæmatoides*, collected last summer in the New Forest by Mr. C. Gulliver.—Mr. McLachlan exhibited a specimen of *Pterostichus madidus*, F., which he had recently found in a potato. It seemed questionable whether the beetle had been bred in the cavity or had entered it for predaceous purposes. Mr. Theodore Wood, Mr. Kirby, and Mr. Herbert Cox took part in the discussion.—Mr. McLachlan also exhibited two specimens of a species of Trichoptera—*Neuronia clathrata*, Kol.—which occurred rarely in Burnt Wood, Staffordshire, and elsewhere in the Midlands. On inquiry he was informed that the two specimens exhibited had been found in the Tottenham Marshes.—Mr. Porritt exhibited a series of *Cidaria russata*, from Yorkshire, the Isle of Man, the Hebrides, and the south of England. The specimens from the two first-named localities were almost black.—Mr. Verrall exhibited a specimen of *Mycetæa hirta*, Marsh., which was found devouring a champagne-cork. The Rev. Canon Fowler remarked that certain *Cryptophagi* had the same habit. The discussion was continued by Mr. McLachlan, Mr. Jenner-Weir, and Dr. Sharp.—Canon Fowler exhibited specimens of *Acronycta alni* and *Leiocampa dictæa*, which came to the electric light on Lincoln Cathedral during the Jubilee illuminations. He also exhibited a specimen of *Harpalus melancholicus*, Dej. —Mr. Billups exhibited, for Mr. Bignell, an interesting collection of British oak-galls. He also exhibited the cocoon and pupa-case of a South American moth, from which he had bred 140 specimens of a species of Ichneumonidæ.—Mr. O. Janson exhibited, for Mr. C. B. Mitford, a collection of Lepidoptera from Sierra Leone.—Mr. White exhibited a curious structure formed by white ants at Akyab.—Mr. Waterhouse exhibited a series of diagrams of the wings of insects, and read notes of observations on the homologies of the veins—a subject to which he had given especial attention for some time past. Mr. Champion, Mr. Verrall, Mr. McLachlan, Dr. Sharp, and Mr. Poulton took part in the discussion which ensued.—Mr. G. T. Baker contributed descriptions of new species of Lepidoptera from Algiers.—Mr. Gervase F. Mathew communicated a paper entitled "Life-histories of Rhopalocera from the Australian Region." The paper was accompanied by elaborate coloured drawings of the perfect insects, their larvæ and pupæ.—Mr. F. Merrifield read a report of progress in pedigree moth-breeding, with observations on incidental points. Mr. Francis Galton alluded to the close attention Mr. Merrifield had given to the subject, and complimented him on the neatness, ingenuity, and skill with which his experiments had been conducted, and on the results he had obtained therefrom. Mr. Poulton, Dr. Sharp, Prof. Meldola, and others continued the discussion.

**Chemical Society**, December 1.—Mr. William Crookes, F.R.S., President, in the chair.—The following papers were read:—The alleged existence of a second nitroethane, by W. R. Dunstan and T. S. Dymond.—An extension of Mendeléeff's theory of solution to the discussion of the electrical conductivity of aqueous solutions, by Holland Crompton.—Note on electrolytic conduction and on evidence of a change in the constitution of water, by Henry E. Armstrong.—Bismuth iodide and bismuth fluoride, by B. S. Gott and M. M. Pattison Muir.—The action of hydrogen sulphide on arsenic acid, by B. Branner, Ph.D., and F. Tomicek.—Note on the constitution of mairogallol, by C. S. S. Webster.

## PARIS.

**Academy of Sciences**, December 12.—M. Janssen in the chair.—On the law of errors of observation, by M. J. Bertrand. Two propositions are affirmed: first, that, if a given magnitude be repeatedly measured, and the measures grouped by twos in haphazard order, by selecting in each group the greatest of the two errors committed the relation of the mean of the squares of these greatest errors to the mean of the squares of all the errors will converge towards the value $1 + \frac{2}{\pi}$, when the number of essays increases indefinitely; second, if the measures be similarly grouped in threes, the mean of the squares of the greatest errors in each group divided by the mean of the squares of all the errors has for probable value $1 + \frac{2\sqrt{3}}{\pi}$, and approaches indefinitely towards this value according as the number of essays is increased.—Comparison of the various systems of electric synchronization for astronomical clocks, by M. C. Wolf. These remarks are made in reference to M. Cornu's recent communication on a new process of synchronizing time-pieces. The various systems hitherto employed for this purpose are passed in review, and their respective merits and defects are studied with exclusive reference to their suitability for employment for synchronizing time in observatories, towns, &c.—On the various modes of explosive decomposition of picric acid and the nitric compounds, by M. Berthelot. This inquiry, instituted in consequence of the doubts recently raised regarding the property of picric acid to explode by heating alone, throws much light on the various modes of decomposition of the nitric compounds properly so called, showing how these various modes depend on the initial temperature of the decomposition.—Remarks in connection with the presentation of a work entitled "Collection des anciens Alchimistes Grecs," by M. Berthelot. This "Collection," just issued by M. Berthelot with the co-operation of the Greek scholar, M. Ch. E. Ruelle, embodies much information regarding the origin of alchemy, the precursor of the modern science of chemistry. Compiled from unedited Greek manuscripts scattered over the public libraries of Europe, it comprises about 400 pages of Greek texts dating from the Alexandrine and Byzantine periods, and mostly anterior to the writers who stimulated chemical studies in the West. Amongst the treatises here for the first time edited are those of the pseudo-Democritus, of Synesius, and Olympiodorus, with French translation, copious notes and commentaries. In the introduction of 300 pages is embodied much information on the mystic relations of metals and planets, on the spheres of astrologists, on the old chemical signs and notations here reproduced by the photogravure process, the whole forming a sequel to the author's work "Sur les Origines de l'Alchimie," presented to the Academy two years ago.—On the application of photography to meteorology, by M. J. Janssen. These remarks are made in connection with the presentation of a series of large photographs which were taken on the Pic du Midi last October with a view to recording meteorological phenomena by the photographic process. The series comprises four views of the section of the Pyrenees within the horizon of the Peak at sunrise just before the solar rays have affected the almost continuous mass of clouds stretching from the Atlantic to the eastern part of the Pyrenees, filling all the valleys and enshrouding all but the highest summits of the range. Other photographs exhibit these clouds when acted on by the early rays of the luminary, and converted into the semblance of a storm-tossed sea. Images were also taken of the remarkable effects observed at sunset, and the satisfactory results of this first essay made it evident that photography may be applied with great advantage to the study of atmospheric phenomena.—Researches on the theory of the figure of the planets, by M. O. Callandreau. These researches, forming a second contribution to the study of the planets, are devoted more especially to the larger members of the solar system, in which the extent of flattening of the poles is an element which cannot be neglected in the general calculation.—On the compressibility of the solution of ethylamine in water, by M. F. Isambert. The experiments here described confirm the conclusions already arrived at by the author, showing that the aqueous solutions of the ammoniacal bases must be regarded as true chemical combinations, more or less dissociated, and dissolved in an excess of water.—On the geographical distribution of the Actiniæ inhabiting the French Mediterranean waters, by M. P. Fischer. A list is given of the thirty-three species already determined on the south coast of France. Of these sixteen are found also on the French Atlantic coast, which comprises twenty-four species not yet discovered in the Mediterranean. The northern limits of the French species have been clearly determined, but not so the southern, several forms occurring also in the Red Sea, and on the North and West African seaboards.

### STOCKHOLM.

**Royal Academy of Sciences**, December 14.—Considerations on some theories of atmospheric electricity, by Prof. Edlund.—On the displacement of the shore line along the coasts of Sweden, by Dr. L. Holmström.—An account of the cosmological theory of Mr. Norman Lockyer, and of the views of Nordenskiöld on the subject, by Prof. Baron Nordenskiöld.—On post Glacial deposits containing *Ancylus fluviatilis*, by H. Munthe.—On *Rubus corylifolius*, Arrh., and *Rubus pruinosus*, Arrh., their nomenclature and value as species, by Dr. L. M. Neuman.—On the hyperborean fir, *Pinus silvestris*, L., *b. lapponica*, by Hr. Th. Örtenbladt.—On the development of the primary bundles of vessels of the Monocotyledons, by Miss S. Andersson.—On oyster-culture in Bohus, by Count Ehrensvörd.—On mutations in the coefficient of elasticity of the metals in consequence of the transmission of a galvanic current, by Dr. Mebius.—On conduction of electricity between flames and points, by K. Asperén.—On the influence of temperature on the exponent of refraction and the density of rock-salt, by Miss N. Lagerborg.—On a recent form of the Echinoconidæ, by Prof. S. Lovén.—On the forms of the fruit of *Trapa natans*, L., which formerly existed in Sweden, by Prof. Nathorst.—On the morphology and development of the Pantopoda, by Dr. G. Adlerz.—Contribution to the knowledge of the carbon-hydrates, by Drs. C. Johansson and Ekstrand.—On the action of fuming sulphuric acid on $\alpha$-naphthalin combined with carbon-hydratic acid, by R. Manzelius.—On the action of sulphuric acid on $\alpha$-nitro-naphthalin, by W. Palmær.—Analytical researches on the air near the fortress of Waxholm, in October 1885, by Dr. A. E. Selander.—On systems of coincidence of common algebraic differential equations, by Dr. J. Möller.—On some algebraic analogies conducting to elliptic integrals, by Dr. A. M. Johansson.—The conditions for an algebraic analogy,

$$y^n = (x-a)^{m^1} \ldots\ldots (x-a)^{m^r},$$

to lead to elliptic integrals, by the same.—On the wave-length of algebraic curves, by G. Kobb.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Gospel Ethnology: S. R. Pattison (Religious Tract Society).—Tenants of an Old Farm: Dr. H. C. McCook (Hodder and Stoughton).—The Gospel in Nature: Dr. H. C. McCook (Hodder and Stoughton).—British Dogs, Nos. 13 and 14: H. Dalziel (U. Gill).—Proceedings of the Birmingham Philosophical Society, vol. v. part 2 (Cornish, Birmingham).—A Critique of Kant: K. Fischer; translated by W. S. Hough (Sonnenschein).—Circulars of Information of the Bureau of Education, No. 1, 1887 (Washington).—The Study of History in American Colleges and Universities: H. B. Adams (Washington).—Des Mortiers Hydrauliques: M. H. Le Chatelier (Dunod, Paris.

## CONTENTS.

PAGE
**The Star of Bethlehem.** (*With Diagram*) . . . . . 169
**The Microscope. By Dr. W. H. Dallinger, F.R.S.** 171
**The Cruise of the** *Dijumphna* . . . . . . . . . . . 173
**Exercises in Quantitative Chemical Analysis** . . . 174
**The Study of Logic. By Alfred Sidgwick** . . . . . 175

**Our Book Shelf :—**

Aveling: "Light and Heat" . . . . . . . . . . 176
Leutemann: "Animals from the Life" . . . . . . 176
Lee: "The Vegetable Lamb of Tartary" . . . . . 176

**Letters to the Editor :—**

The Royal Horticultural Society.—**Dr. Maxwell T. Masters, F.R.S.** . . . . . . . . . . . . . 176
Classification of Clouds.—**Rev. W. Clement Ley** . 177
Effect of Snow on the Polarization of the Sky.—**James C. McConnel** . . . . . . . . . . . . 177
The Ffynnon Beuno and Cae Gwyn Caves.—**Worthington G. Smith** . . . . . . . . . . . . 178
The Planet Mercury.—**W. F. Denning** . . . . . 178
Meteor of November 15.—**J. Lloyd Bozward** . . . 178
A Correction.—**Prof. J. J. Sylvester, F.R.S.** . . . 179
**Isolation of Fluorine. By A. E. Tutton** . . . . . . 179
**Timber, and some of its Diseases. I.** (*Illustrated.*) **By Prof. H. Marshall Ward** . . . . . . . . . . 182
**Notes** . . . . . . . . . . . . . . . . . . . . 186
**Astronomical Phenomena for the Week 1887 December 25–31** . . . . . . . . . . . . . . 158
**The U.S. Commission of Agriculture. By Prof. John Wrightson** . . . . . . . . . . . . . . . . 188
**Weights and Measures** . . . . . . . . . . . . . 189
**University and Educational Intelligence** . . . . . 189
**Scientific Serials** . . . . . . . . . . . . . . . 190
**Societies and Academies** . . . . . . . . . . . . 190
**Books, Pamphlets, and Serials Received** . . . . . . 192